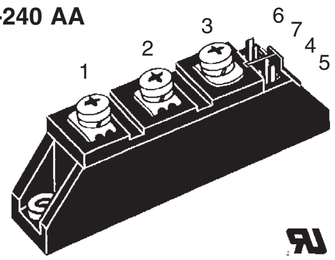
Thyristor Modules
Thyristor/Diode Modules

I_{TRMS} = 2x80 A
I_{TAVM} = 2x51 A
V_{RRM} = 800-1800 V

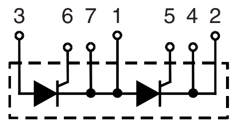
V_{RSM} V_{DSM}	V_{RRM} V_{DRM}	Type					
V	V	Version	1 B	8 B	Version	1 B	8 B
900	800	MCC 44-08	io1 B /	io8 B	MCD 44-08	io1 B /	io8 B
1300	1200	MCC 44-12	io1 B /	io8 B	MCD 44-12	io1 B /	io8 B
1500	1400	MCC 44-14	io1 B /	io8 B	MCD 44-14	io1 B /	io8 B
1700	1600	MCC 44-16	io1 B /	io8 B	MCD 44-16	io1 B /	io8 B
1900	1800	MCC 44-18	io1 B /	io8 B	MCD 44-18	io1 B /	io8 B

TO-240 AA

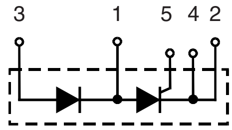


Symbol	Conditions		Maximum Ratings	
I_{TRMS}, I_{FRMS}	$T_{VJ} = T_{VJM}$		80	A
I_{TAVM}, I_{FAVM}	T_C = 83°C; 180° sine		51	A
	T_C = 85°C; 180° sine		49	A
I_{TSM}, I_{FSM}	T_{VJ} = 45°C;	t = 10 ms (50 Hz), sine	1150	A
	V_R = 0;	t = 8.3 ms (60 Hz), sine	1230	A
	$T_{VJ} = T_{VJM;}$			
	t = 10 ms;	(50 Hz), sine	1000	A
	V_R = 0;	t = 8.3 ms (60 Hz), sine	1070	A
I^2dt	T_{VJ} = 45°C;	t = 10 ms (50 Hz), sine	6600	A^2s
	V_R = 0,	t = 8.3 ms (60 Hz), sine	6280	A^2s
	$T_{VJ} = T_{VJM;}$	t = 10 ms (50 Hz), sine	5000	A^2s
	V_R = 0;	t = 8.3 ms (60 Hz), sine	4750	A^2s
$(di/dt)_{cr}$	$T_{VJ} = T_{VJM;}$	repetitive, I_T = 150 A	150	A/µs
	f = 50Hz; t_P = 200µs;			
	$V_D = {}^2/_3\ V_{DRM}$;			
	I_G = 0.45 A;	non repetitive, $I_T = I_{TAVM}$	500	A/µs
	di_G/dt = 0.45 A/µs			
$(dv/dt)_{cr}$	$T_{VJ} = T_{VJM}$;	$V_{DR} = {}^2/_3\ V_{DRM}$	1000	V/µs
	$R_{GK} = \infty$; method 1 (linear voltage rise)			
P_{GM}	$T_{VJ} = T_{VJM}$;	t_P = 30 µs	10	W
	$I_T = I_{TAVM}$;	t_P = 300 µs	5	W
P_{GAV}			0.5	W
V_{RGM}			10	V
T_{VJ}			-40...+125	°C
T_{VJM}			125	°C
T_{stg}			-40...+125	°C
V_{ISOL}	50/60 Hz, RMS;	t = 1 min	3000	V~
	$I_{ISOL} \leq$ 1 mA;	t = 1 s	3600	V~
M_d	Mounting torque (M5)		2.5-4.0/22-35	Nm/lb.in.
	Terminal connection torque (M5)		2.5-4.0/22-35	Nm/lb.in.
Weight	typical including screws		90	g

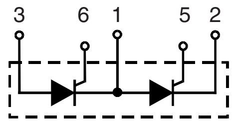
MCC
Version 1 B



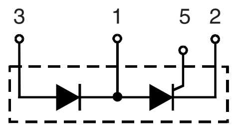
MCD
Version 1 B



MCC
Version 8 B



MCD
Version 8 B



Features

- International standard package, JEDEC TO-240 AA
- Direct copper bonded Al_2O_3-ceramic base plate
- Planar passivated chips
- Isolation voltage 3600 V~
- UL registered, E 72873
- Gate-cathode twin pins for version 1B

Applications

- DC motor control
- Softstart AC motor controller
- Light, heat and temperature control

Advantages

- Space and weight savings
- Simple mounting with two screws
- Improved temperature and power cycling
- Reduced protection circuits

419

IXYS reserves the right to change limits, test conditions and dimensions

Symbol	Conditions			Characteristic Values	
I_{RRM}, I_{DRM}	$T_{VJ} = T_{VJM}$; $V_R = V_{RRM}$; $V_D = V_{DRM}$			5	mA
V_T, V_F	I_T, I_F = 200 A; T_{VJ} = 25°C			1.75	V
V_{T0}	For power-loss calculations only (T_{VJ} = 125°C)			0.85	V
r_T				5.3	mΩ
V_{GT}	V_D = 6 V;	T_{VJ} = 25°C		1.5	V
		T_{VJ} = -40°C		1.6	V
I_{GT}	V_D = 6 V;	T_{VJ} = 25°C		100	mA
		T_{VJ} = -40°C		200	mA
V_{GD}	$T_{VJ} = T_{VJM}$;	V_D = 2/3 V_{DRM}		0.2	V
I_{GD}				10	mA
I_L	T_{VJ} = 25°C; t_P = 10 µs, V_D = 6 V I_G = 0.45 A; di_G/dt = 0.45 A/µs			450	mA
I_H	T_{VJ} = 25°C; V_D = 6 V; $R_{GK} = \infty$			200	mA
t_{gd}	T_{VJ} = 25°C; V_D = 1/2 V_{DRM} I_G = 0.45 A; di_G/dt = 0.45 A/µs			2	µs
t_q	$T_{VJ} = T_{VJM}$; I_T = 120 A, t_P = 200 µs; -di/dt = 10 A/µs V_R = 100 V; dv/dt = 20 V/µs; $V_D = {}^2/_3\ V_{DRM}$		typ.	150	µs
Q_S	$T_{VJ} = T_{VJM}$; I_T/I_F = 50 A, -di/dt = 0.64 A/µs			90	µC
I_{RM}				11	A
R_{thJC}	per thyristor/diode; DC current	other values		0.53	K/W
	per module	see Fig. 8/9		0.265	K/W
R_{thJK}	per thyristor/diode; DC current			0.73	K/W
	per module			0.365	K/W
d_S	Creepage distance on surface			12.7	mm
d_A	Strike distance through air			9.6	mm
a	Maximum allowable acceleration			50	m/s²

Optional accessories for module-type MCC 44 version 1 B
Keyed gate/cathode twin plugs with wire length = 350 mm, gate = yellow, cathode = red
Type **ZY 200L** (L = Left for pin pair 4/5) } UL 758, style 1385,
Type **ZY 200R** (R = right for pin pair 6/7) } CSA class 5851, guide 460-1-1

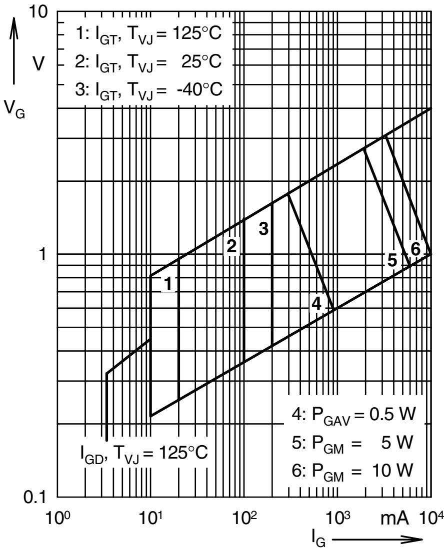


Fig. 1 Gate trigger characteristics

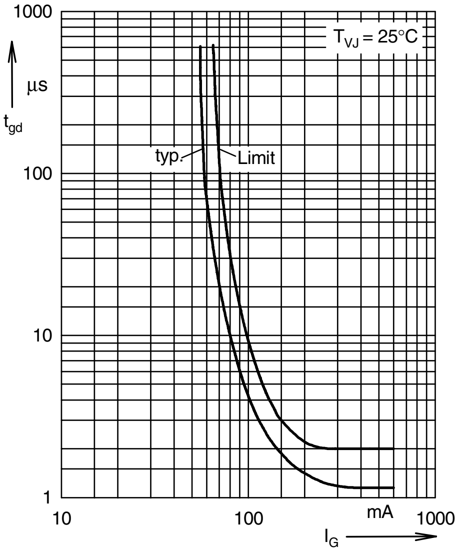
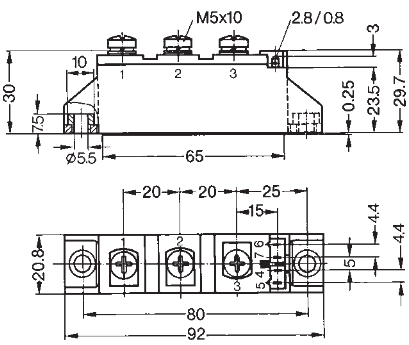


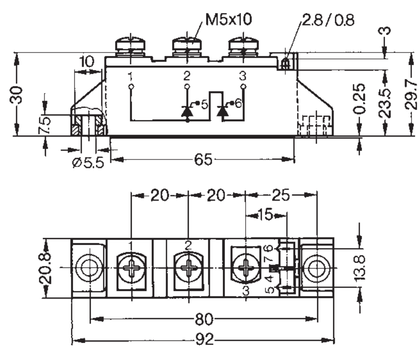
Fig. 2 Gate trigger delay time

Dimensions in mm (1 mm = 0.0394")

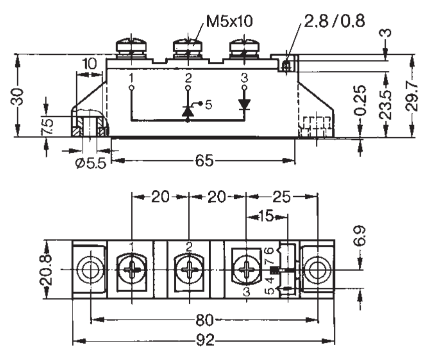
MCC/MCD Version 1 B



MCC Version 8 B



MCD Version 8 B



IXYS reserves the right to change limits, test conditions and dimensions

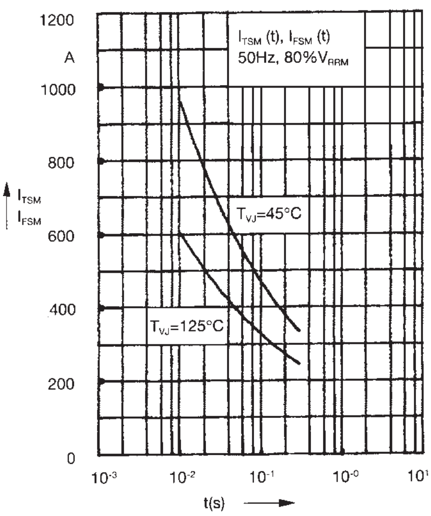


Fig. 3 Surge overload current
I_{TSM}, I_{FSM}: Crest value, t: duration

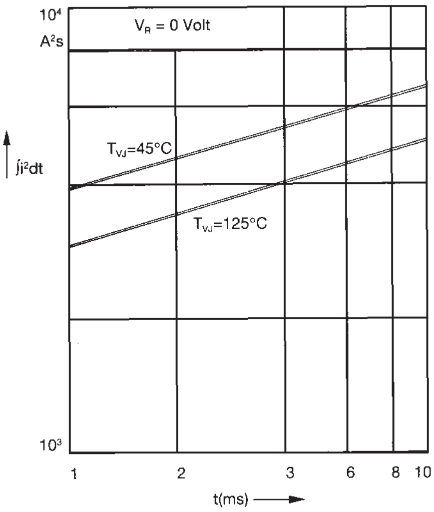


Fig. 4 ∫i²dt versus time (1-10 ms)

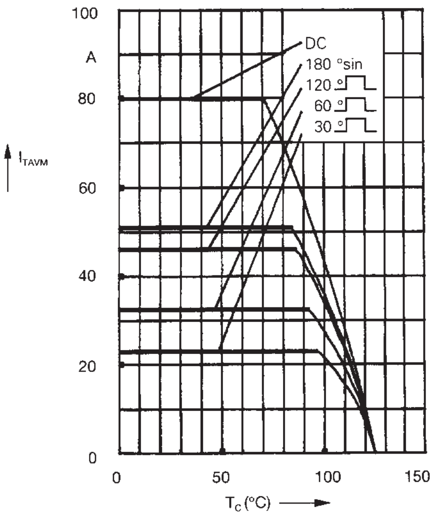


Fig. 4a Maximum forward current
at case temperature

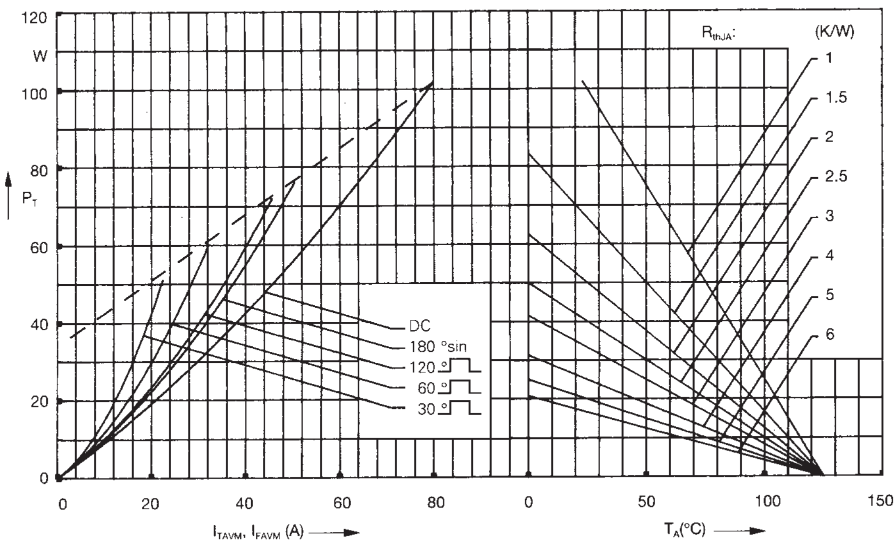


Fig. 5 Power dissipation versus on-state current and ambient temperature (per thyristor or diode)

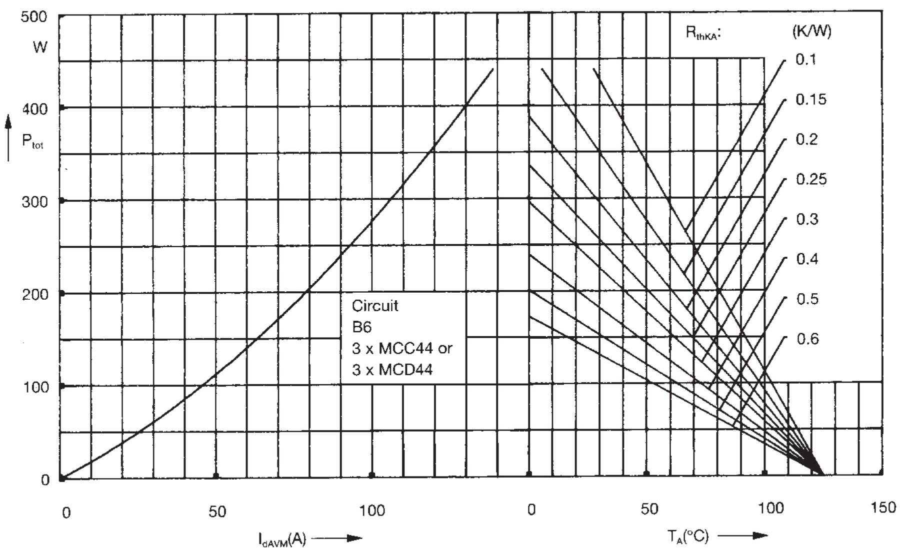


Fig. 6 Three phase rectifier bridge:
Power dissipation versus direct output current and ambient temperature

419

IXYS reserves the right to change limits, test conditions and dimensions

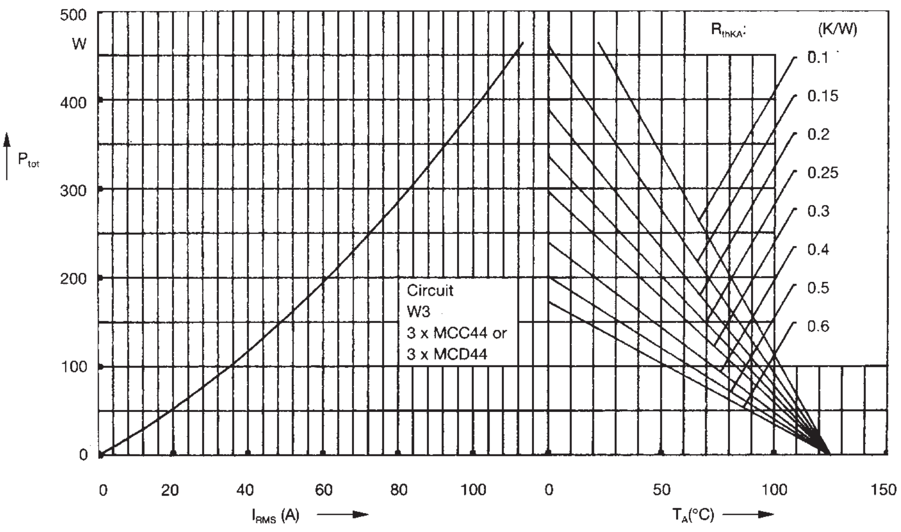


Fig. 7 Three phase AC-controller: Power dissipation versus RMS output current and ambient temperature

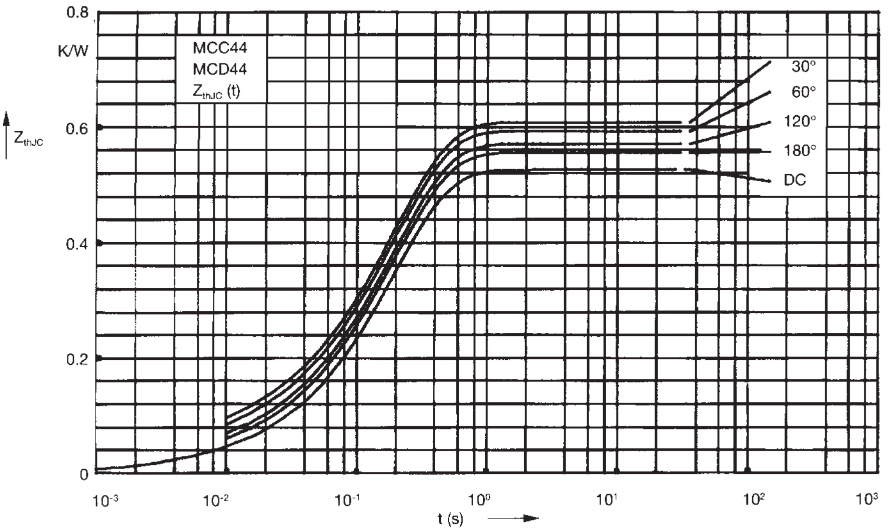


Fig. 8 Transient thermal impedance junction to case (per thyristor or diode)

R_{thJC} for various conduction angles d:

d	R_{thJC} (K/W)
DC	0.53
180°	0.55
120°	0.58
60°	0.6
30°	0.62

Constants for Z_{thJC} calculation:

i	R_{thi} (K/W)	t_i (s)
1	0.015	0.0035
2	0.026	0.02
3	0.489	0.195

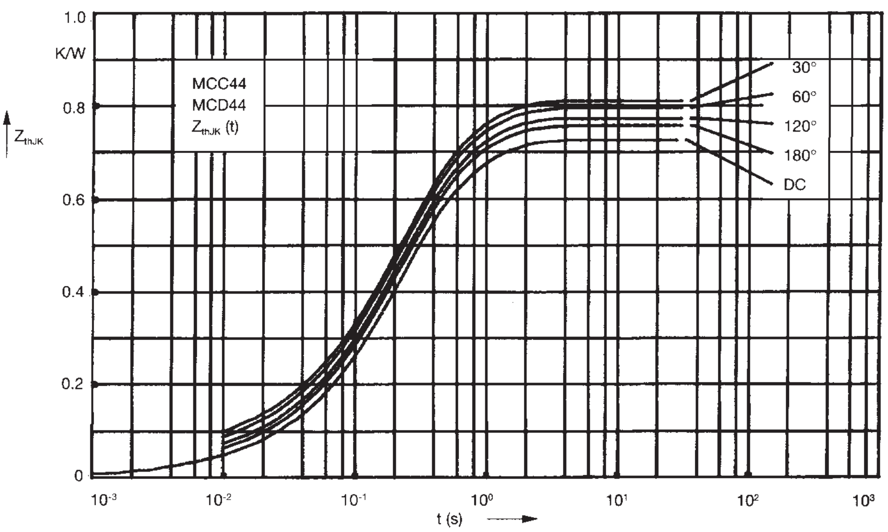


Fig. 9 Transient thermal impedance junction to heatsink (per thyristor or diode)

R_{thJK} for various conduction angles d:

d	R_{thJK} (K/W)
DC	0.73
180°	0.75
120°	0.78
60°	0.8
30°	0.82

Constants for Z_{thJK} calculation:

i	R_{thi} (K/W)	t_i (s)
1	0.015	0.0035
2	0.026	0.02
3	0.489	0.195
4	0.2	0.68

419